

**IDAHO DEPARTMENT OF LANDS**  
**DIRECTOR'S OFFICE**  
300 N 6th Street Suite 103  
PO Box 83720  
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**IDAHO OIL AND GAS**  
**CONSERVATION COMMISSION**  
*James Classen*  
*Ken Smith*  
*Margaret Chipman*  
*Chris Beck*  
*Sid Cellan*

February 18, 2014

Rick Sandtveit  
Trendwell West, Inc.  
PO Box 560  
Rockford, MI 49341

SUBJECT: Permit to Drill LU600553 (API#11-027-20-003), Smith 1-10

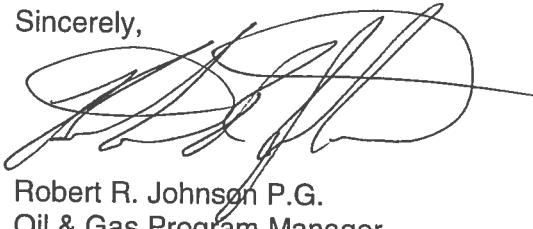
The Idaho Department of Lands has completed our review of this permit to drill for oil. Enclosed is a copy of the approved permit. This permit was approved with the following stipulations:

1. The permittee shall be required to submit an affidavit covering the initial BOP pressure test after installation signed by the operator or contractor attesting to the satisfactory pressure test.
2. The permittee shall ensure tanks are adequately sized, designed and constructed for the reception and confinement of mud and cuttings and to prevent contamination of streams and potable water.
3. Drilled holes cannot be used for any other purposes unless they are constructed according to the applicable well construction standards administered by the Idaho Department of Water Resources.
4. Applicant will obtain any needed water rights from Idaho Department of Water Resources if nearby wells will be used to supply water for the drilling operations.
5. All well log information required by IDAPA 20.07.02.091 will be submitted to IDL within 30 days of the logs being run.
6. In accordance with IDAPA 20.07.02.290 a gas to oil ratio test will be required to be conducted by the applicant no later than 30 days after the completion of the Smith 1-10. The results of the test will be provided within 20 days to the Idaho Department of Lands.
7. Idaho Department of Lands inspectors shall have 24 hour, unencumbered access for compliance and regulatory purposes.

Please ensure that all operations are conducted in accordance with the requirements of IDAPA 20.07.02 (Rules Governing Conservation Of Crude Oil And Natural Gas In The State Of Idaho).

This permit will be administered by Nancy Welbaum in our Southwest Supervisory Area. She will be inspecting the drilling operation. Please contact her at 208-334-3488 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Johnson', with a large, sweeping loop at the end.

Robert R. Johnson P.G.  
Oil & Gas Program Manager

cc: Nancy Welbaum, Senior Resource Specialist, IDL Southwest Office  
Chad Hersley, IDWR, PO Box 83720, Boise, Idaho 83720-0098  
Patricia A. Nilsson, Development Services Director, Canyon County



# IDAHO OIL AND GAS CONSERVATION COMMISSION

## Application For Permit to Drill, Deepen or Plug Back

API #

11-027-

20003

LU600553

APPLICATION TO: Drill (\$2,000) ☒ Deepen (\$500) ☐ Plug Back (\$500) ☐

NAME OF COMPANY OR OPERATOR: Trendwell West, Inc.

Date: 01/15/2014

Address: 10 Bridge Street, Suite 200 PO Box 560

City: Rockford State: MI Zip Code: 49341 Telephone: (616) 866-5024

Contact Name: Richard Sandtveit Email Address: rick@trendwellenergy.com

### DESCRIPTION OF WELL AND LEASE

Name of Lease: Smith Well Number: 1-10 Elevation (ground): 2,435'

Well Location: Section: 10 Township: T5N Range: R4W (or block and survey)

(give footage from Section lines): 3,300' from the south section line and 1,820' from the east section line

Field and Reservoir (if wildcat, so state): Oil Wildcat County: Canyon

Distance, in miles, and direction from nearest town or post office: The well is approximately 6 miles north of Notus, ID

Nearest distance from proposed location to property or lease line: bearing of N54W and 400' from the location to PL feet

Distance from proposed location to nearest drilling, completed or applied for on the same lease: NA feet

Proposed depth: 5,200' Rotary or cable tools: Rotary

Planned logging tools: Triple Combo - Gamma Ray, SP, CNL, CDT, Dual Induction

Approx date work will start: April 1, 2014 Number of acres in lease(s): 40 acre unit - 720.876 acres leased

Number of wells on lease, including this well, completed in or drilling to this reservoir: 1

If lease purchased with one or more wells drilled, complete the following information:

Purchased from (name):

Address of above:

Status of bond:

Remarks: (If this is an application to deepen or plug back, briefly describe work to be done, giving present producing zone and expected new producing zone)

CERTIFICATE: I, the undersigned, state that I am the Vice President of Engineering of Trendwell West, Inc. (company) and that I am authorized by said company to make this application and that this application was prepared under my supervision and direction and that the facts stated herein are true, correct and complete to the best of my knowledge.

Date: 1/15/2014

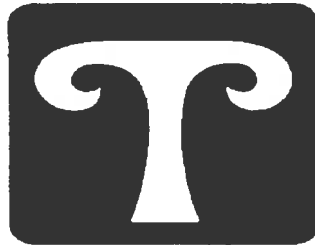
Signature:

Richard A. Sandtveit

Permit Number: LU600553 Approval Date: 2-19-2014 Approved by:

API Number: 11-027-20003

**NOTICE:** Before sending in this form, be sure that you have given all information requested. See instructions on back.



Trendwell West, Inc.  
10 E Bridge Street – Suite 200  
PO Box 560  
Rockford, MI 49341

IDL Supplement to Permit For  
Smith #1-10 Well  
Canyon County, Idaho

January 15, 2014

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## 1. Background Information

The objective of this operation is to drill a vertical well to test productivity in primarily the Webber Sand and secondarily in the Hamilton and/or Willow Sands.

Well Type: Vertical  
Well Name: Smith #1-10  
State: Idaho  
County: Canyon  
Township: 5N  
Range: 4W  
Section: 10

### Mapping Reference:

NAD83:

UTMI 11 Idaho West - Zone 1103

Mag Dec: 14.15<sup>0</sup>      Grid Conv: -0.75113<sup>0</sup>      Total Corr: 14.90113<sup>0</sup>

### Coordinates – NAD83:

#### Surface Location:

Lat: N 43<sup>0</sup> 47' 14.09435"  
Long: W 116<sup>0</sup> 48' 00.23737"  
SPCS: N 774572.674'  
E 2347381.323'

#### Bottom Hole Location:

Lat: N 43<sup>0</sup> 47' 14.09435"  
Long: W 116<sup>0</sup> 48' 00.23737"  
SPCS: N 774572.674'  
E 2347381.323'

### Elevations:

GL: 2,435'  
KB: 2,450' (estimated)

### Intended Total Depth of Well:

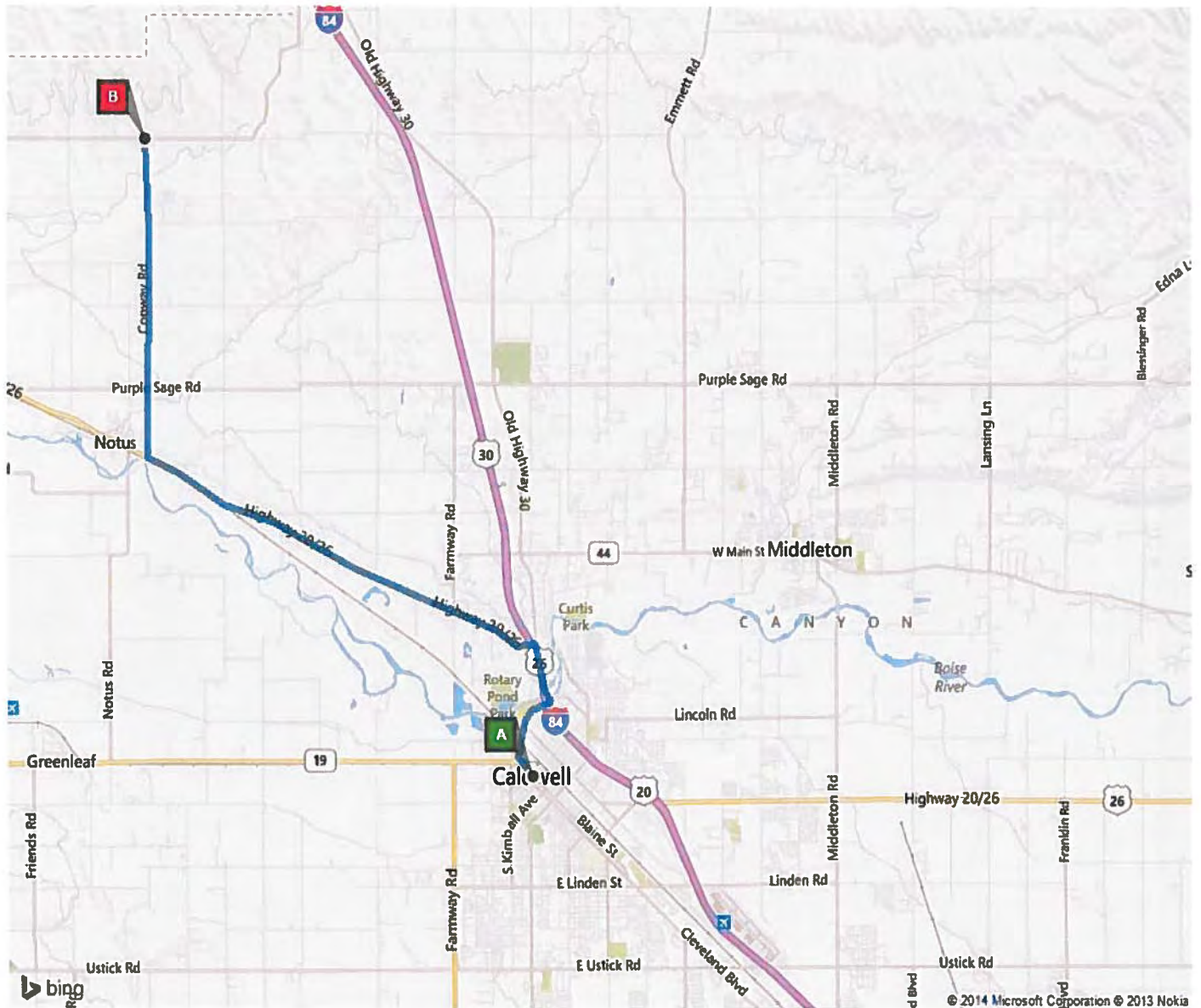
MD: 5,200'  
TVD: 5,200'

## 1.1. Well Location Information

### Directions from Caldwell, ID:

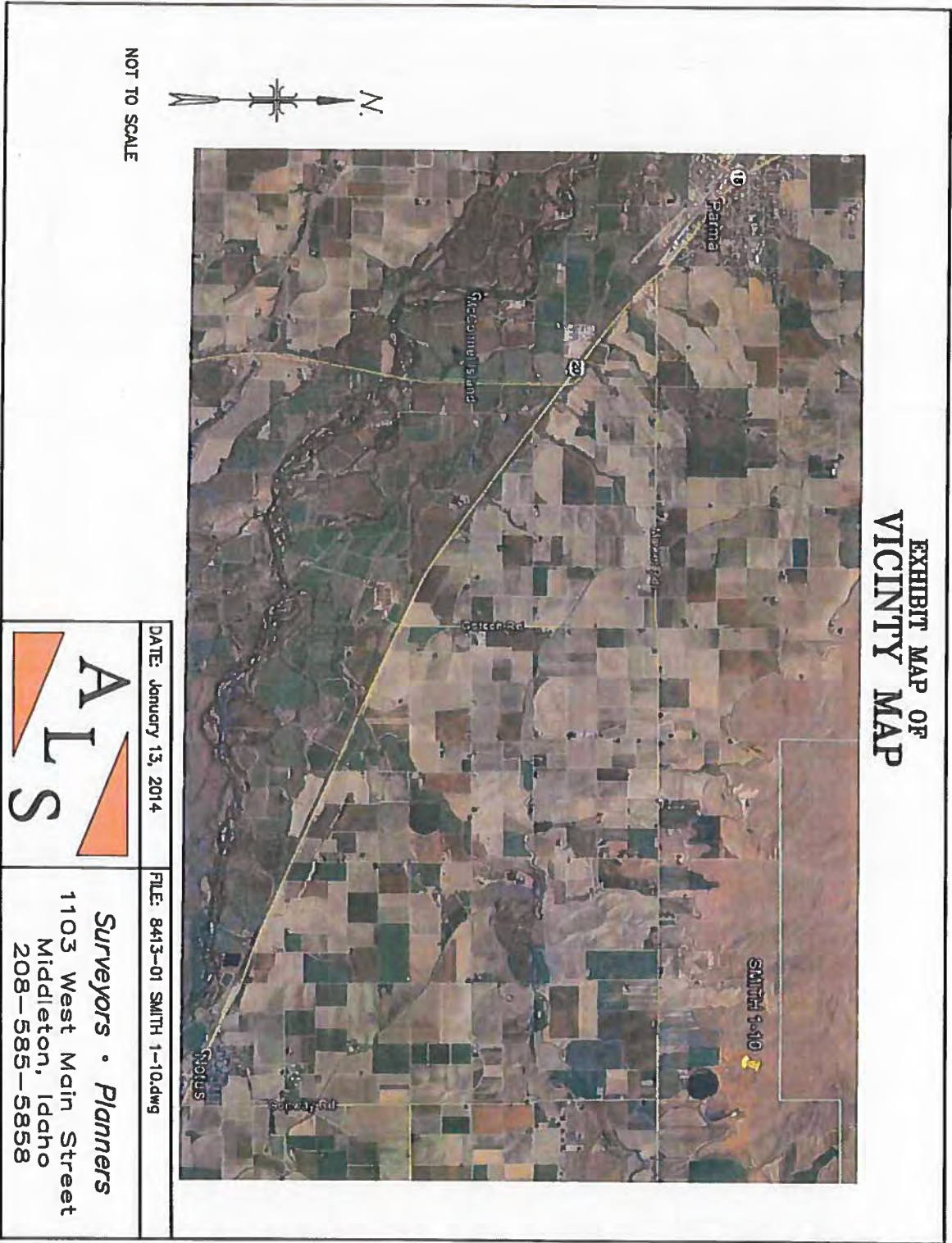
Go northwest on I-84 and take exit 26 on US-20/US-26. Go left on US-20/US-26 approximately 5.6 miles to Conway Road (just outside the town of Notus). Turn right or north on Conway road and follow approximately 6 miles to Market Road. Turn left or west on Market Road and go about  $\frac{1}{4}$  mile to the lease road on the right or north side of Market Road. Follow the lease road about 3,400 feet to location.

## 1.2. Access Map





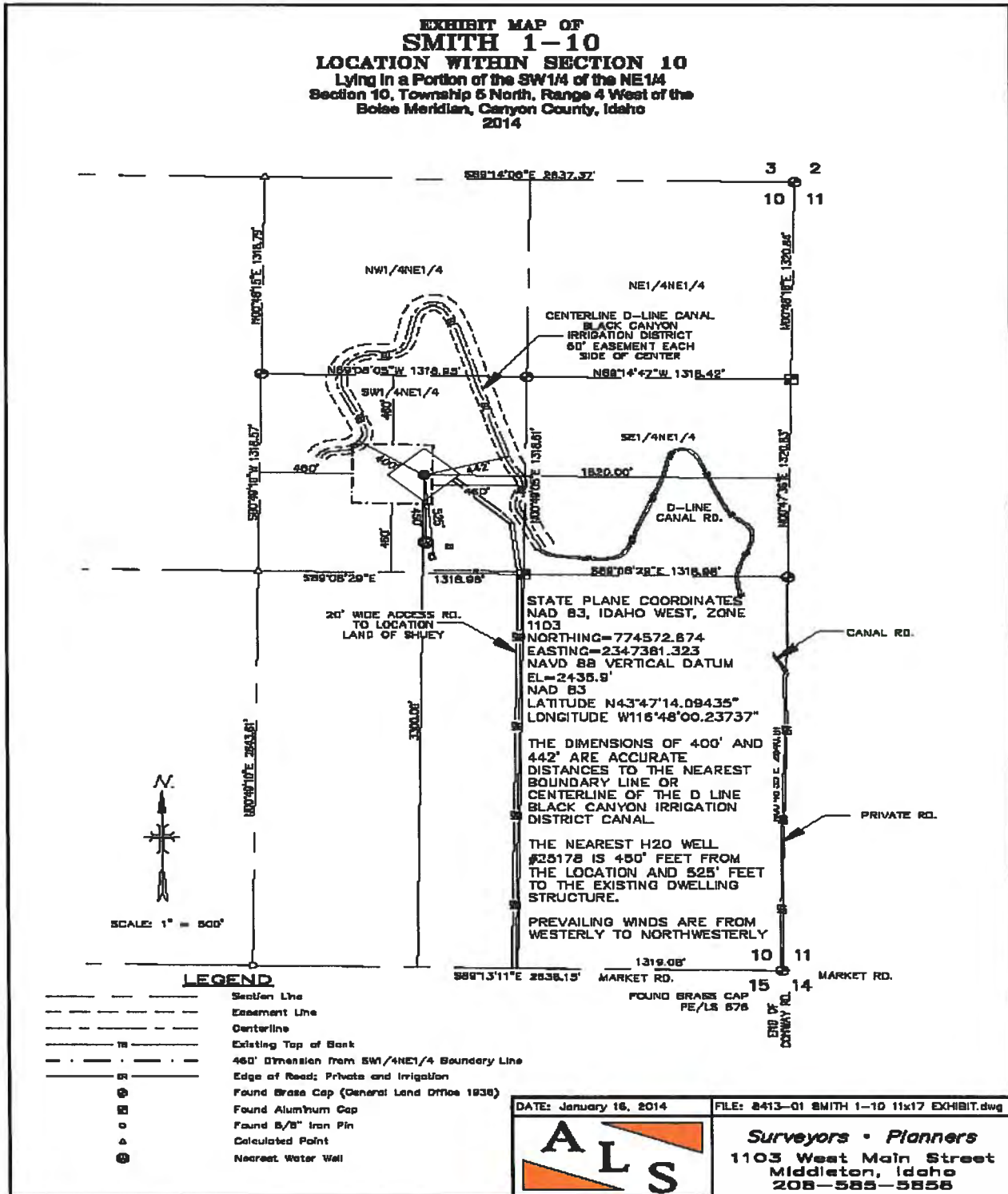
1.3. Vicinity Map



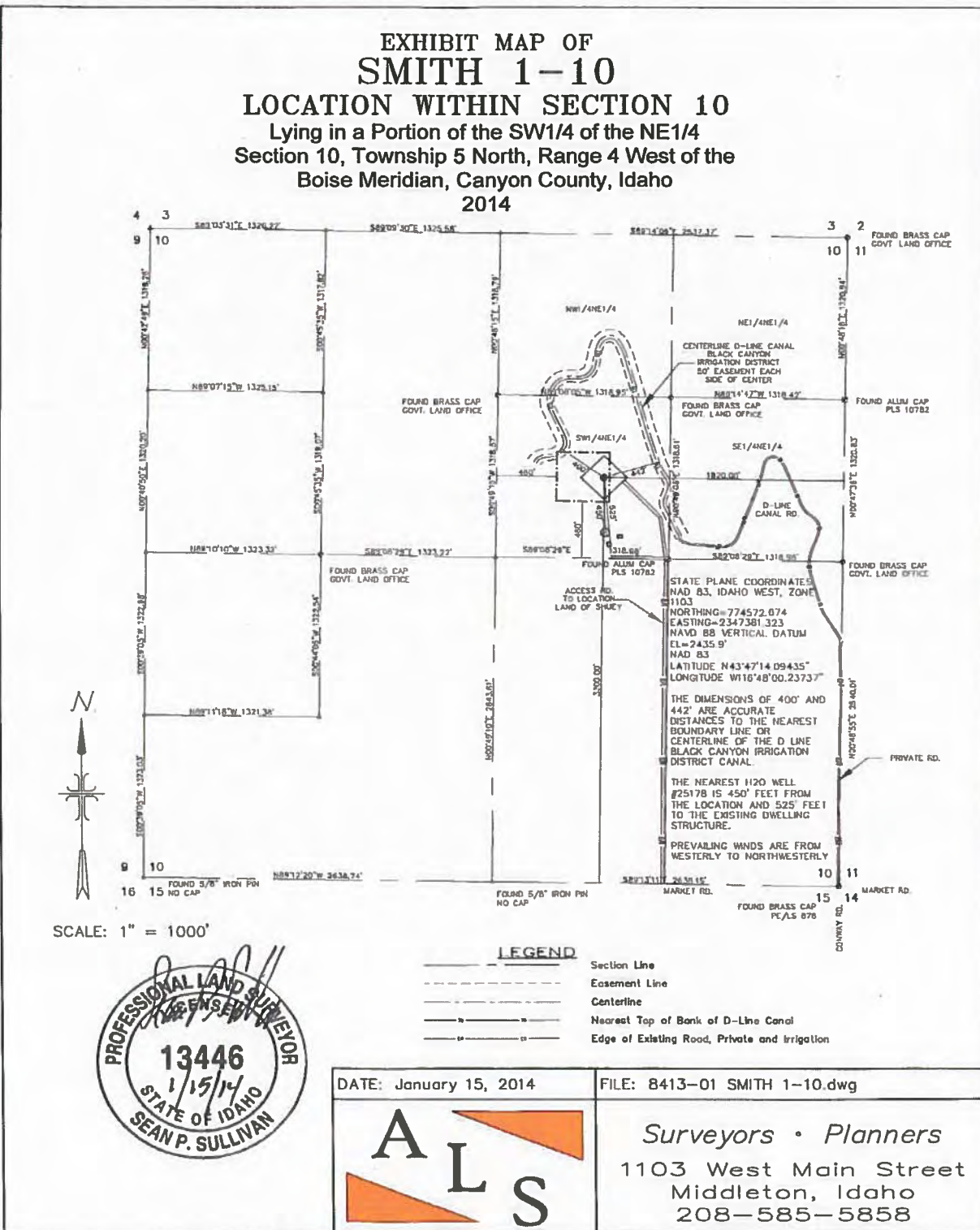


## 1.4. Surveyor's Maps

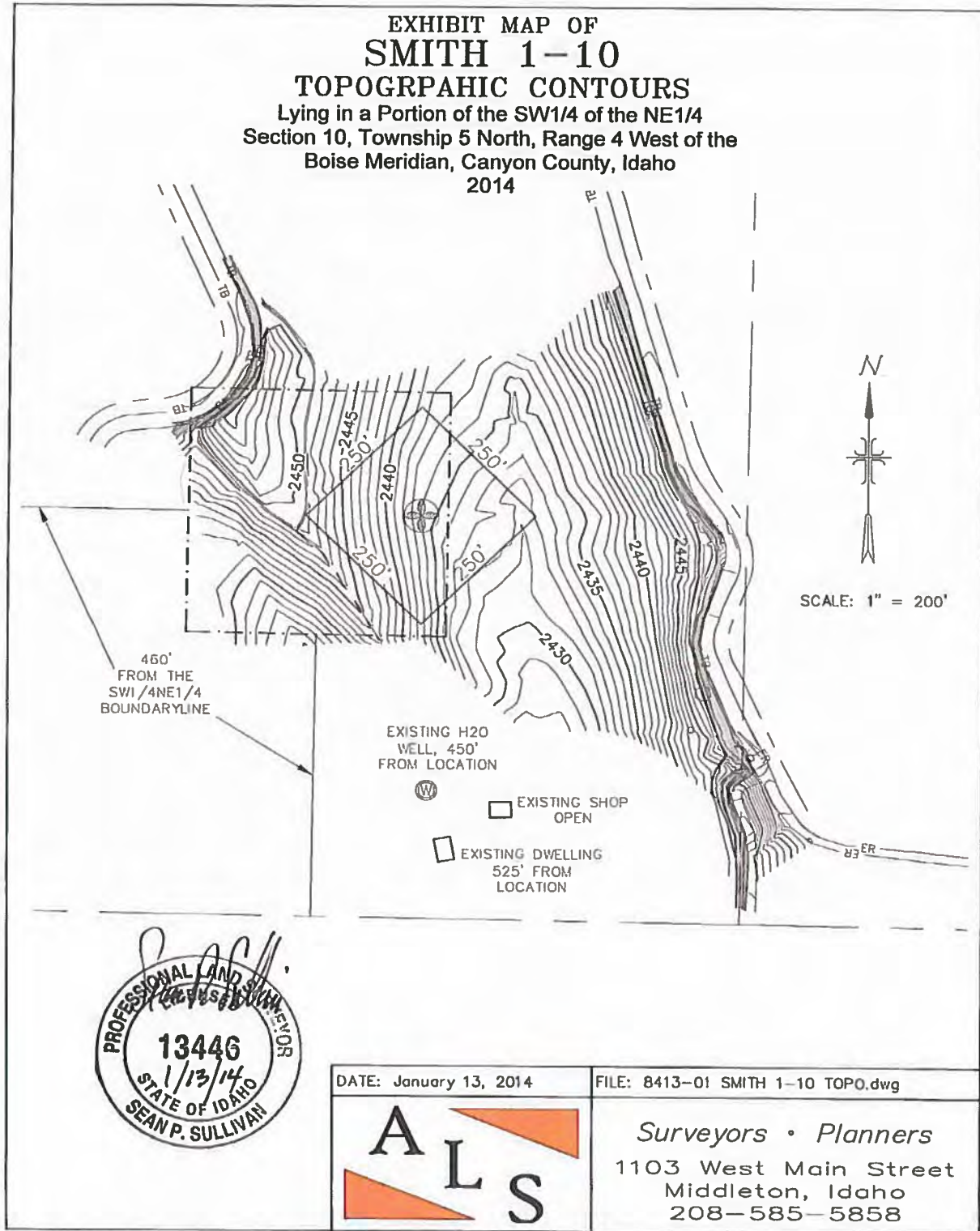
### 1.4.1. Location Map East Half of Section



## 1.4.2 Location Map Full Section

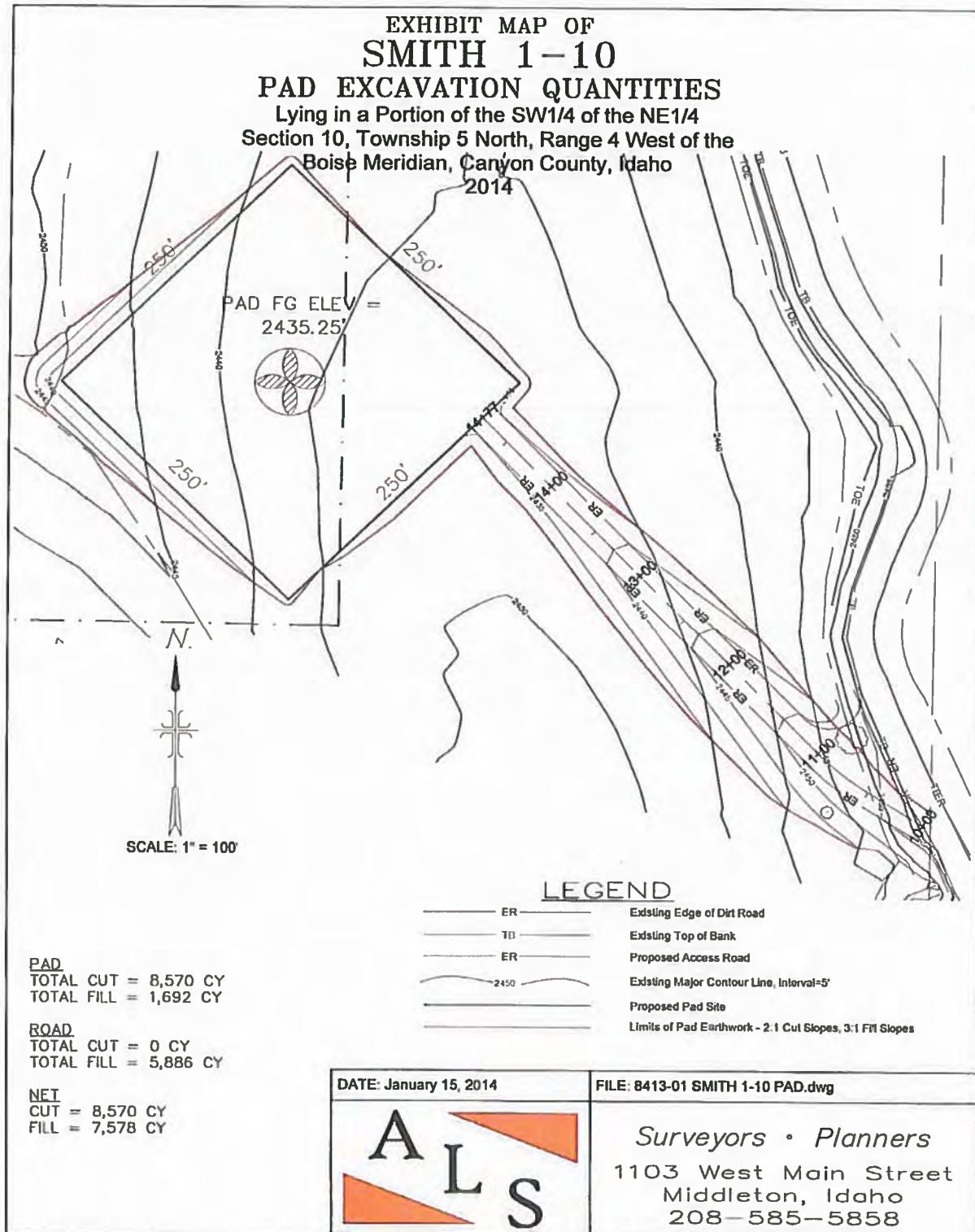


### 1.4.3. Contour Map

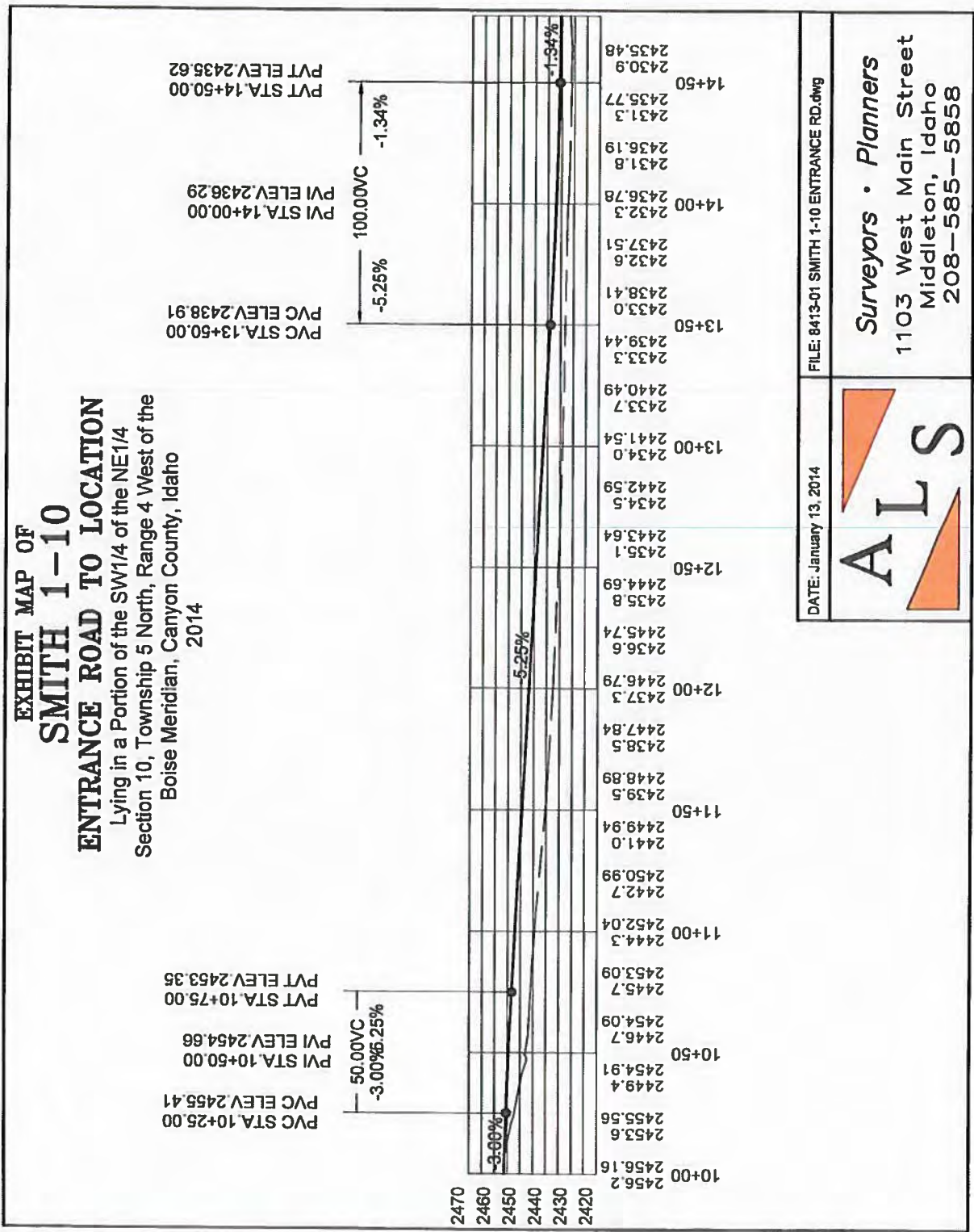




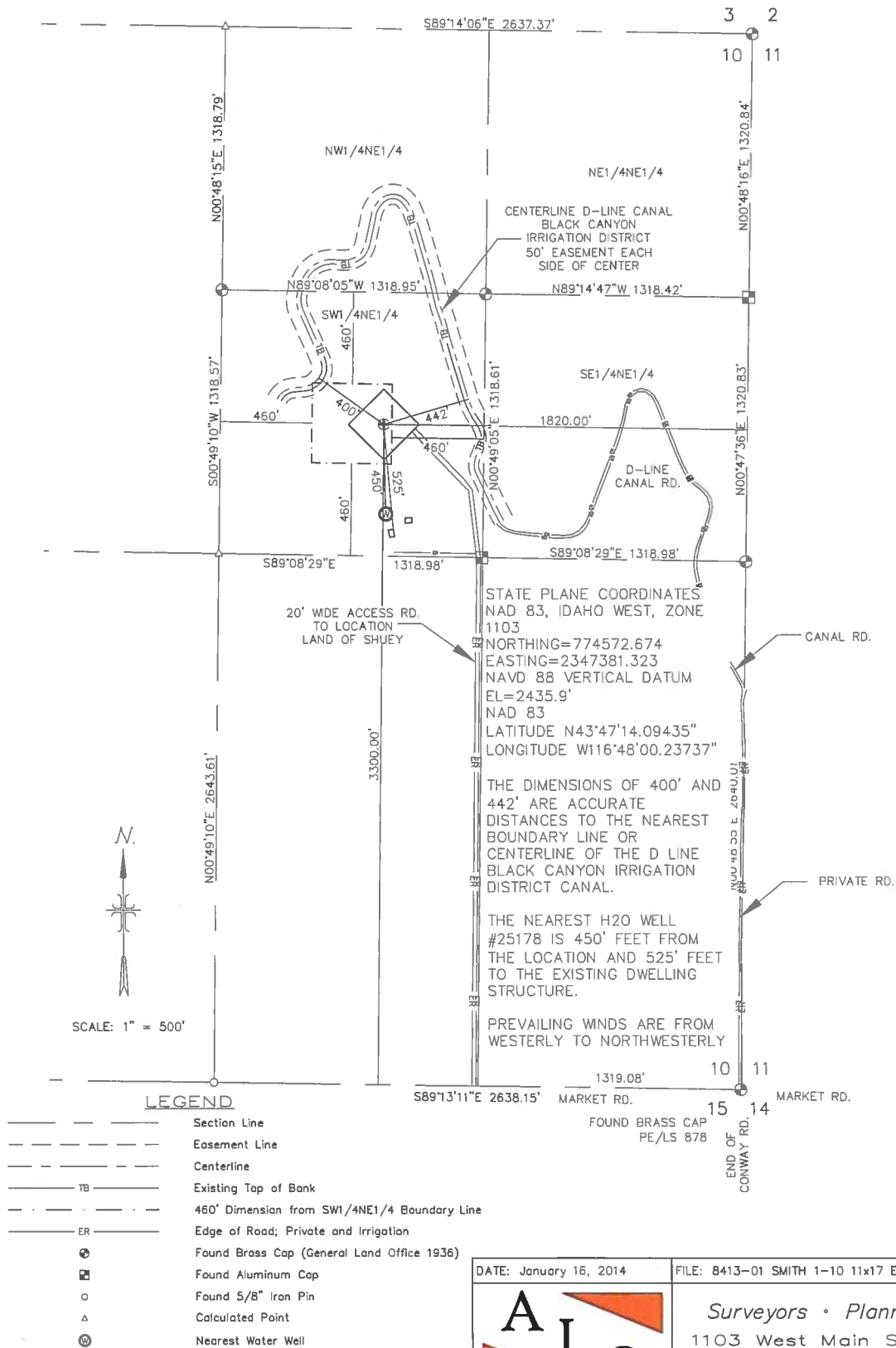
## 1.4.4. Excavation Map



# 1.4.5. Road Elevations at Pad Entrance

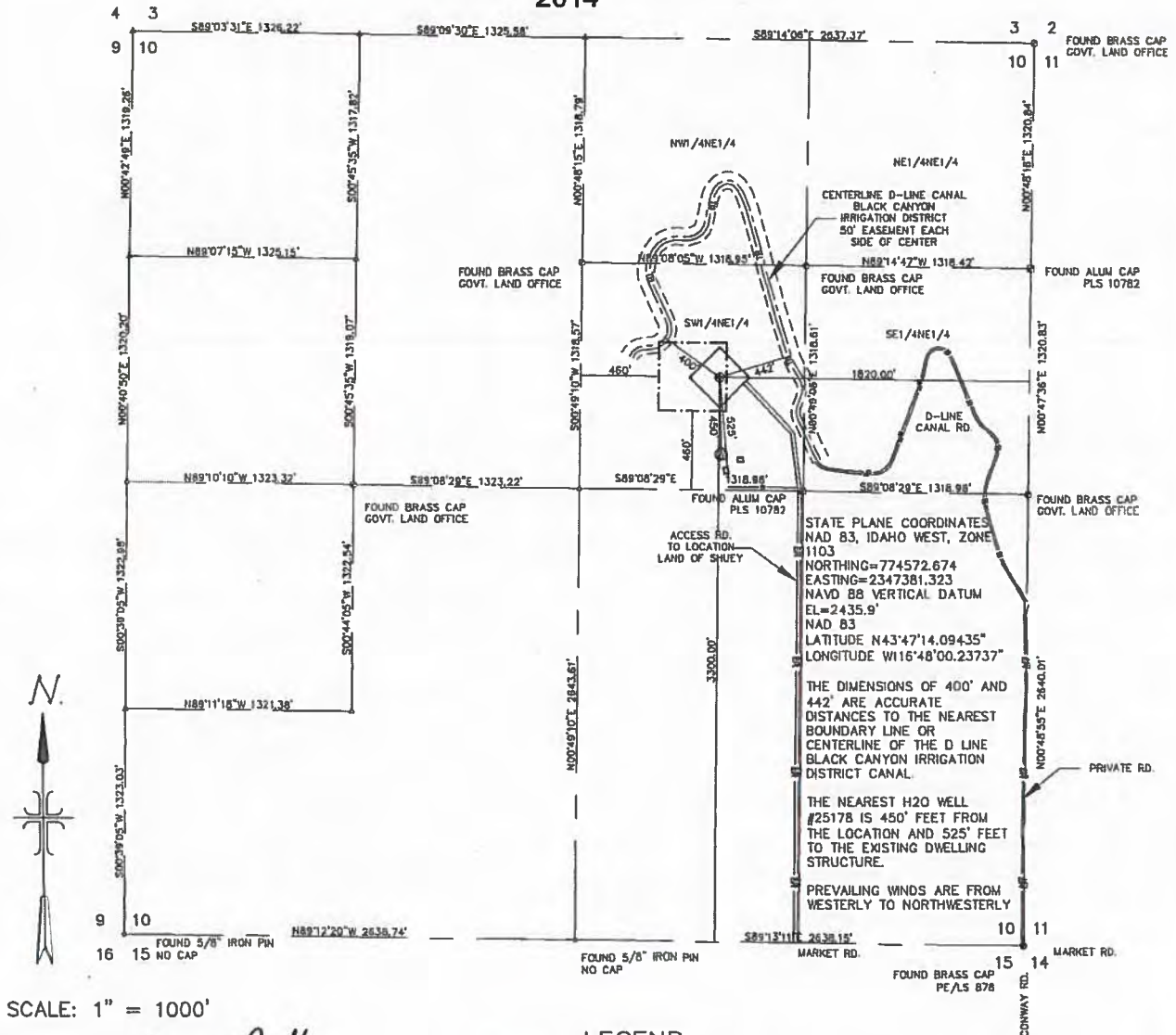


Lying in a Portion of the SW1/4 of the NE1/4  
Section 10, Township 5 North, Range 4 West of the  
Boise Meridian, Canyon County, Idaho  
2014





**EXHIBIT MAP OF  
SMITH 1-10  
LOCATION WITHIN SECTION 10**  
Lying in a Portion of the SW1/4 of the NE1/4  
Section 10, Township 5 North, Range 4 West of the  
Boise Meridian, Canyon County, Idaho  
2014



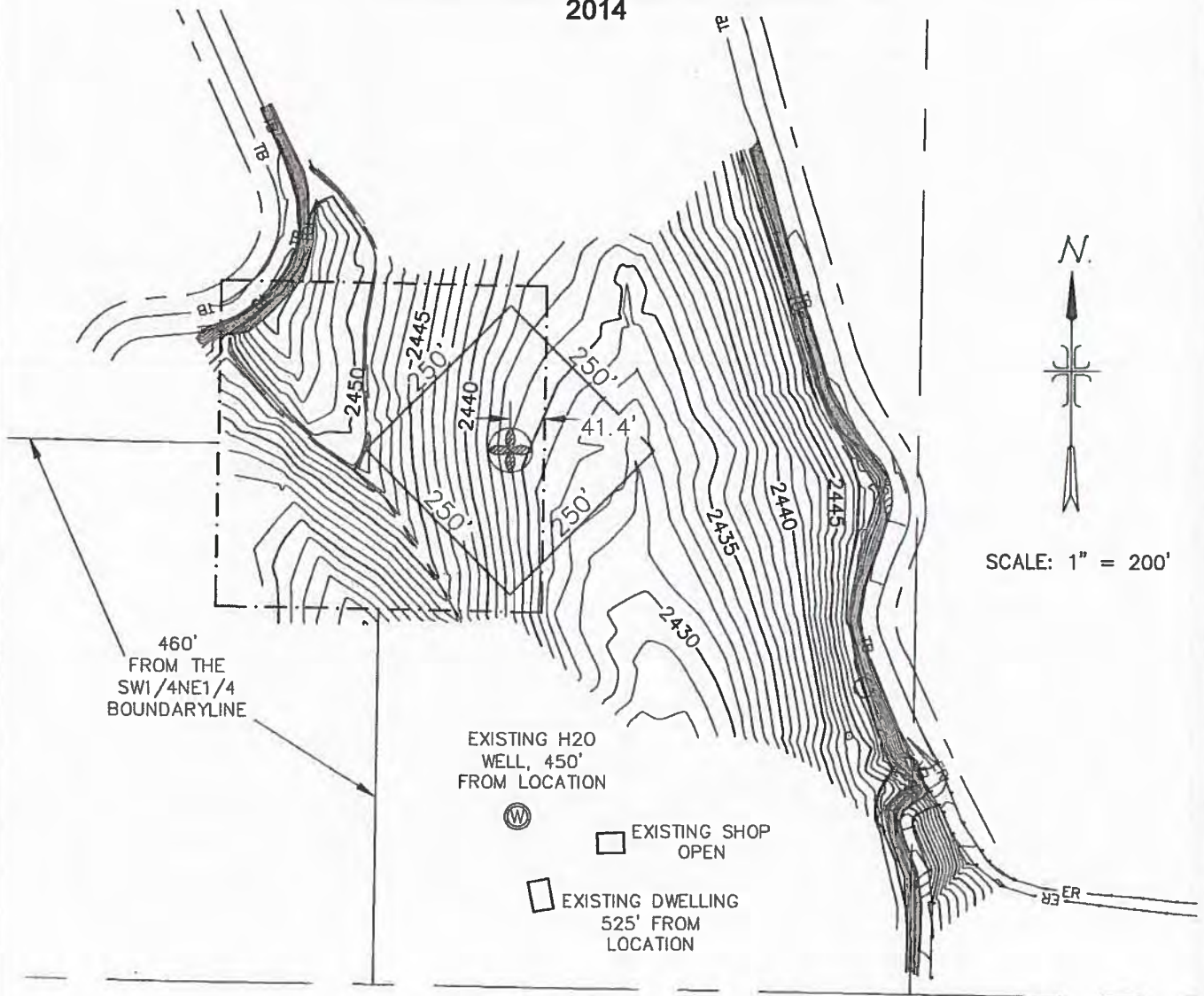
DATE: January 15, 2014

FILE: 8413-01 SMITH 1-10.dwg



*Surveyors • Planners*  
1103 West Main Street  
Middleton, Idaho  
208-585-5858

**EXHIBIT MAP OF  
SMITH 1-10  
TOPOGRAPHIC CONTOURS**  
Lying in a Portion of the SW1/4 of the NE1/4  
Section 10, Township 5 North, Range 4 West of the  
Boise Meridian, Canyon County, Idaho  
2014



DATE: January 14, 2014

FILE: 8413-01 SMITH 1-10 TOPO.dwg



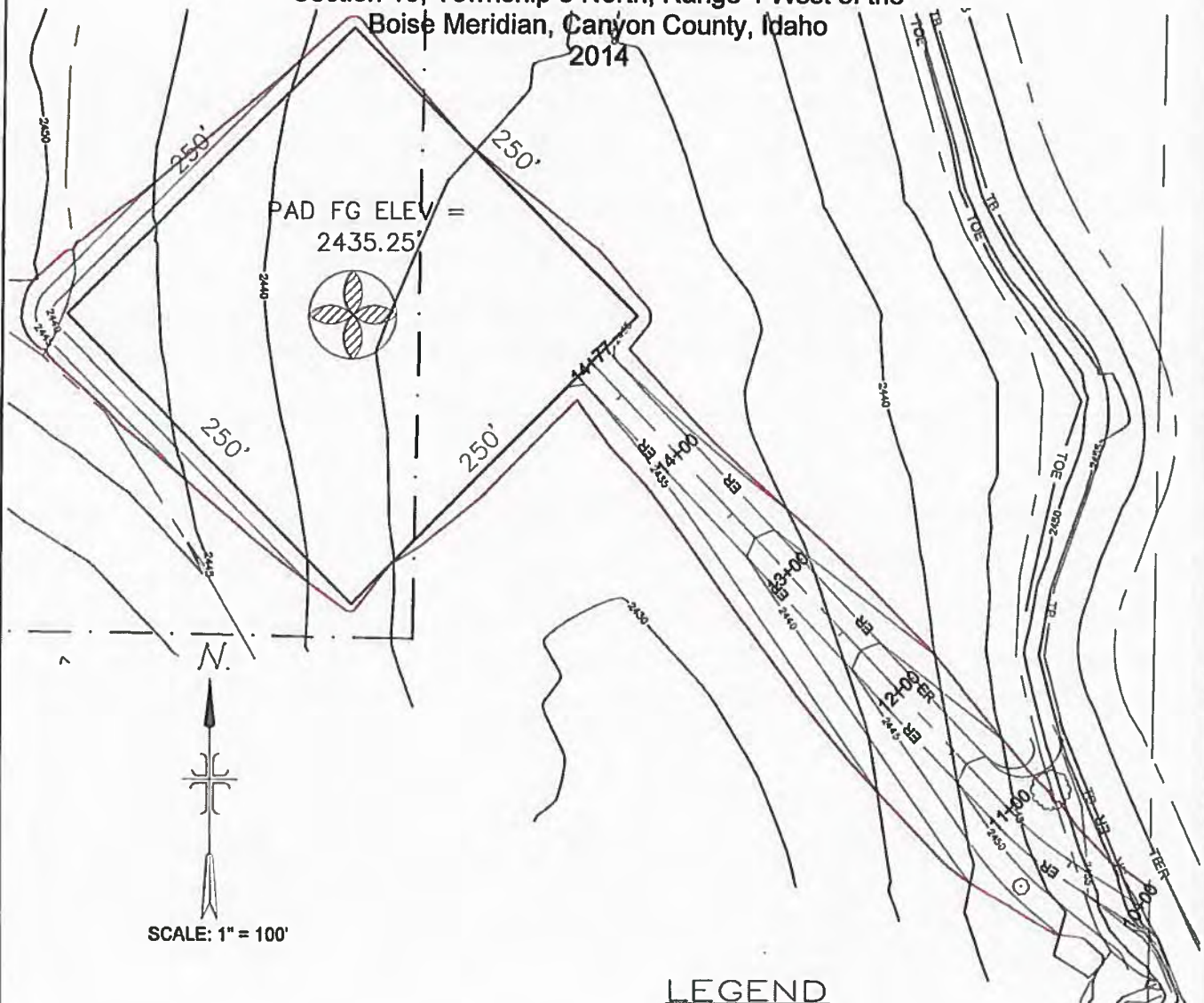
*Surveyors • Planners*  
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Middleton, Idaho  
208-585-5858



# EXHIBIT MAP OF SMITH 1-10 PAD EXCAVATION QUANTITIES

Lying in a Portion of the SW1/4 of the NE1/4  
Section 10, Township 5 North, Range 4 West of the  
Boise Meridian, Canyon County, Idaho

2014



## LEGEND

- |          |  |
|----------|--|
| — ER —   | Existing Edge of Dirt Road                               |
| — TB —   | Existing Top of Bank                                     |
| — ER —   | Proposed Access Road                                     |
| — 2450 — | Existing Major Contour Line, Interval=5'                 |
| — —      | Proposed Pad Site  |
| — —      | Limits of Pad Earthwork: 2:1 Cut Slopes, 3:1 Fill Slopes |

**PAD**  
TOTAL CUT = 8,570 CY  
TOTAL FILL = 1,692 CY

**ROAD**  
TOTAL CUT = 0 CY  
TOTAL FILL = 5,886 CY

**NET**  
CUT = 8,570 CY  
FILL = 7,578 CY

DATE: January 15, 2014

FILE: 8413-01 SMITH 1-10 PAD.dwg



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208-585-5858

**2. Geological Prognosis**

**2.1. Anticipated Formation Tops**

Trendwell West, Inc.  
Canyon County,  
Idaho

Smith #1-10	
10-5N-4W	
SWNE	
Ground Elevation Estimate	2,436'

### **3. Site Preparation**

#### **3.1. Access Roads**

The proposed surface location is to be accessed by an upgraded private road off Waters Road about ¼ mile west of the intersection with Conway Road. The length of the road upgrade is approximately 3,400' on private property. See attached drawings 1.4.1, 1.4.2, and 1.4.5.

#### **3.2. Location and Erosion Control**

Appropriate grading, mechanical stabilization (rip-rap or hay bales), chemical stabilization (soil cement), and silt fencing will be used to prevent soil erosion. All cut and fill slopes are designed with a minimum 2: 1 grade to minimize runoff erosion and ensure mechanical stability. See attached drawing 1.4.4.

#### **3.3. Cellar Design**

An 8' deep round cellar box will be installed after the conductor is set and cemented.

#### **3.4. Proposed Pit System**

A closed-loop circulating system will be used for this well from spud. Zero discharge practices will be implemented, and all cuttings and waste fluid will be solidified and disposed of at an approved facility.

#### **3.5. Sump**

The location will have a 2' deep trench on downhill sides where the spoil from that trench will be used to construct an earthen berm around the location. The trench will act as a sump to collect rain and wash water for controlled release or appropriate disposal as required. See attached drawing 1.4.4.

#### **3.6. Disposition of Drill Cuttings**

After the cuttings are solidified, they will be disposed of at an approved land fill disposal site.

#### 4. Well Construction

##### 4.1. Casing and Cementing Program

Well Interval	Bit Size	Casing Size, Grade, and Weight	Casing Set Depth	Top of Cement	Cement Excess, Type, and Volume
Surface	17 ½"	13 3/8" H-40 48 lb/ft	130'	Cement to Surface	100% Class A 140 sks
Intermediate	10 5/8"	8 5/8" J-55 24 lb/ft	1,000'	Cement to Surface	60% Lead – Thixmix (13.1 ppg), 175 sks Tail – Surface Tail (14.8 ppg) 100 sks
Production	7 7/8"	5 ½" J-55 15.5 lb/ft	5,200'	Cement to Surface	60% Lead –TCI Lite (12.7 ppg) Tail – Gas Seal (16.0 ppg) 210 sks

See wellbore schematic on next page



Trendwell Energy Corporation  
Canyon County, Idaho – Smith 1-10

### 4.2 Wellbore Schematic

Bit Size	Casing Size	Casing Grade/Weight		Set Depth	Cement Vol/Type	Top of Cement
17 1/2"	13 3/8"	H-40 48 lb/ft		GL ref 130'	100% Excess 167 cuft 140 sks Class A 15.6 ppg 1.18 cuft/sk	Surface
10 5/8"	8 5/8"	J-55 24 lb/ft		GL ref 1,000'	60% Excess Lead: 323 cuft 175 sks Thixmix Tail: 136 cuft 100 sks Surface Tail	Surface
7 7/8"	5 1/2"	J-55 15.5 lb/ft		GL ref 5,200'	60% Excess Lead: 910 cuft 500 sks TCI Lite Tail: 242 cuft 210 sks Gas Seal	Surface

### **4.3. Blow-Out Prevention**

#### **4.3.1. BOP Configuration**

BOP Stack configuration includes an annular preventer and double ram preventers. The top most ram preventer will be fitted with variable ram blocks, the lower ram preventer will be fitted with blind ram blocks. A full-opening safety valve, inside BOP, and functioning wrench -specific to the pipe in use and only those specific to the pipe in use - are to be kept on the rig floor with easy access at all times .

#### **4.3.2. BOP Testing**

Test annular, rams, choke manifold, FOSV, and BOP when BOP is first nipped up on casinghead. Low-pressure test to 250 psi and high-pressure test to 3,000 psi (100% of SM wellhead), except for annular. Test annular preventer to 2,100 psi (70% of 3,000 psi rating). Test the kelly hose and standpipe back to pump isolation valves to 200 psi above pop off setting or minimum of 3,000 psi. All tests must hold for five minutes. Retest specific component each time a seal is broken. Work BOP's and flush choke lines each trip. Tighten BOP and wellhead bolts every 3 days. Non-ported float valves to be used in BHA after surface casing set.

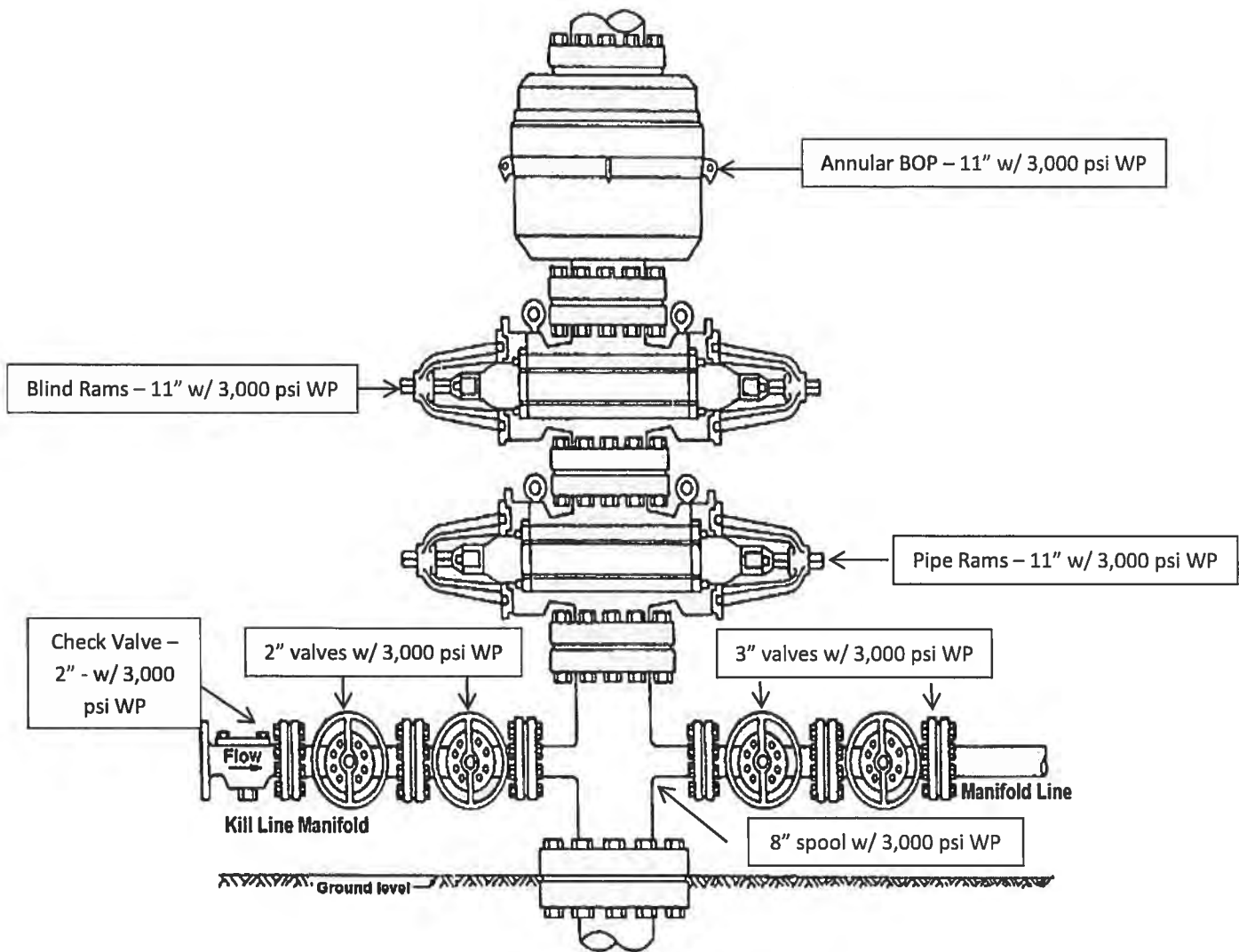
During drilling and completion operations, the ram-type blow-out preventer shall be function tested by closing on the drill pipe once every seven (7) days. Independently powered accumulators or accumulators and pumps shall maintain a pressure capacity reserve at all times to provide for repeated operation of hydraulic preventers. All tests may be conducted using a test plug. Tests shall be recorded by charts, if required by the Supervisor.

**See BOP diagram on next page**

### 4.3.1 Blow Out Prevention - Configuration

Trendwell West, Inc.  
BOP Configuration  
Canyon County, Idaho – Smith 1-10

Maximum Anticipated Surface Pressure – 2,000 psi



#### 4.4. General Mud Program

##### GENERAL DRILLING/MUD OVERVIEW

###### INTERVAL I: 0 – 130'

- |    |                     |   |
|----|---------------------|---|
| 1. | Hole size           | : 17 ½"                                   |
| 2. | Casing size         | : 13 3/8"                                 |
| 3. | Mud type            | : Low solids, nondispersed polymer (LSND) |
| 4. | Total mud volume    | : 200 bbls (150 bbls surface volume)      |
| 5. | Directional Program | : Vertical Hole                           |
| 6. | Interval Duration   | : 1 day                                   |
| 7. | Drilling Challenges | : Surface Alluvium and Clays              |

###### INTERVAL II: 130'- 1,000' MD

- |    |                     |   |
|----|---------------------|---|
| 1. | Hole size           | : 10 5/8"                                     |
| 2. | Casing size         | : 8 5/8"                                      |
| 3. | Mud type            | : LSND DMA Polymer System                     |
| 4. | Total mud volume    | : 400 bbls. (250 bbls surface volume)         |
| 5. | Directional Program | : Vertical/Straight Hole                      |
| 6. | Interval Duration   | : 3 days                                      |
| 7. | Drilling Challenges | : Surface Unconsolidated Sands/Swelling Clays |

###### INTERVAL III: 1,000'- 5,200' MD

- |    |                     |   |
|----|---------------------|---|
| 1. | Hole size           | : 7 7/8"                                      |
| 2. | Casing size         | : 5 ½"  |
| 3. | Mud type            | : Freshwater LSND DMA System                  |
| 4. | Total mud volume    | : 650 bbls. (250 bbls surface volume)         |
| 5. | Directional Program | : Vertical/Straight Hole                      |
| 6. | Interval Duration   | : 9 days                                      |
| 7. | Drilling Challenges | : Swelling clays, shales, possible gas influx |

##### GENERAL MUD PROGRAM NOTES/REMARKS

- I. Mud weights to be adjusted as dictated by hole conditions or formation pressure, especially through the 7 7/8" production interval. Maintain minimum mud weights possible for safe hole conditions, and to minimize the severity of lost circulation and differential sticking tendencies.
- II. Implement an effective closed-loop solids removal program, to include linear shakers, mud cleaner, and centrifuge. Drill solids should be stabilized with Zorbix, Sawdust or other appropriate reagent, and disposed offsite to local landfill (as approved).
- III. Continuous Mud Engineer will be utilized.

- IV. Monitor all drilling parameters on a continual basis to determine safe, cost-effective drilling operations and mud treatments.
- V. Maintain an adequate supply of Barite and LCM additives on location at all times. Maximum mud weights of ~10.5ppg may be anticipated, and the potential for significant whole mud losses should be expected, especially in the shallow hole intervals and through any volcanics.
- VI. The area of interest is near an active Geothermal resource that is being developed for electricity generation. Bottom hole temperatures of over 200°F should be expected, therefore mud treatments and cement should be considered to accommodate elevated temperatures.

17 1/2" Surface Interval				
MD (ft)		0 to 130 feet		
Drilling Fluid System		Ca++ Fresh Water		
Interval Target Mud Properties				
Mud Weight (ppg)	8.4 to 8.6		Plastic Viscosity (cp)	4 to 10
Funnel Viscosity (s/qt)	26 to 32		Yield Point (lb/100 ft <sup>2</sup> )	4 to 10
pH	8.0 to 9.0		Ca+ (mg/L)	700 to 1,100
API FL (ml/30 min)	Natural		CaCl (mg/L)	<1,200

#### **Safety Recommendations:**

- Ensure all proper PPE is used when handling products.
- Wear a respirator while mixing all drilling additives.
- Review MSDS prior to use of unfamiliar materials.

#### **Interval Objective:**

- Drill a 17 1/2" hole from 0 to 130 ft (MD) and set 13 3/8" casing.
- The recommended fluid system for the 17 1/2" interval is **Ca++ Water**.

#### **Mud Weight:**

- Mud density in this interval should be unweighted and **8.4-8.6**.
- Use solids control equipment throughout interval and dilute if SCE is ineffective.

#### **System Maintenance:**

- Spud in with fresh water and start additions of Gypsum.
- Follow (System Setup) protocols if using recycled WBM from a prior well

- If gravel is encountered, Mud up and raise Vise to > 60 s/qt.
- Use PHPA high viscosity hole cleaning sweeps every 150-250 ft while drilling.
- Add Soap and SAPP sticks (alternate Yi stick every connection) for bit balling if encountered
- Mud rings may be avoided by additions of SAPP.
- Maintain pH between 8.0-9.0.
- Use all available solids control equipment to maintain drill solids as low as possible.

### System Setup:

- Move 250 bbls of prior well transferred mud into pits and add 250 bbls water (if available)

10 5/8" Intermediate Interval				
MD (ft)	130 to 1,000 feet			
Drilling Fluid System	Ca++ - Fresh water base low solids, nondispersed polymer system			
Interval Target Mud Properties				
Mud Weight (ppg)	8.6 to 9.4		Plastic Viscosity (cp)	8 to 18
Funnel Viscosity (s/qt)	40 to 55		Yield Point (lb/100 ft <sup>2</sup> )	8 to 18
pH	8.5 to 9.5		Ca+ (mg/L)	700 to 1,100
API FL (ml/30 min)	< 8		CaCl (mg/L)	<1,200

### Safety Recommendations:

- Caustic Soda will be utilized throughout this section to maintain pH and alkalinities, so ensure all proper PPE is used when handling (face shield, rubber gloves, and apron).
- Wear a respirator while mixing all drilling additives .
- Review MSDS prior to use of unfamiliar materials.

### Interval Objective:

- Drill a 10 5/8" hole from 130-1,000 ft (MD) and run 8 5/8" casing.
- The recommended fluid system for the end of the 10 5/8" interval from 130-1,000 ft (MD) is Ca++ LSND.

### Mud Weight:

- Mud density in this interval should range from 8.6-9.4 ppg.
- Mud weight should be increased as needed to assist with shale ECD's.
- Use solids control equipment as needed.
- Maintain expected MW or as hole conditions dictate per Drilling Engineer and/or Company Man.
- If higher MW is required and lower solids are required, raise MW with additions of barite.



See calculation below: Equation: Sacks of Barite (100 lb sacks) = Total Volume x 14.9 x (Final MW (ppg) - Original MW (ppg))/(35 - Final MW (ppg))

Example: Sacks of Barite (100 lb sacks) = 1000 bbls x 14.9 x (10.0 ppg - 9.0 ppg)/(35 - 10.0 ppg) = 596 sacks

- Take continuous MW readings while mixing barite.

### **System Maintenance:**

- Raise pH (8.5 -9.5) with caustic soda through the Chem barrel.
- Raise the total hardness to 700-1100 mg/l with additions of Gypsum to control sloughing shales.
- A sudden drop in pH could signal the presence of CO<sub>2</sub> in the formation and immediate action will be required to counteract the CO<sub>2</sub>. If CO<sub>2</sub> is encountered, pH will decrease, the bicarbonate reading on the alkalinity mud test will increase, and viscosity will decrease.
- Add Lime as needed over a circulation and running Caustic through the chemical barrel until pH is back to 8.5-9.5.
- Maintain FV around 40-55 s/qt.
- Begin lowering API FL to <8 ml/30 min with the addition of FLA.

### **Solids Control:**

- Use the best combination of screens on the shakers, DeSander, DeSilter, and Centrifuge for the system.
- If available, run centrifuge in mechanical stripping mode constantly to maintain solids content at or below 8%. (Note: Running centrifuge in full mechanical stripping mode will strip HGS from the system - additional barite will be needed after running centrifuge in this manner.) If the centrifuge is ineffective in stripping ultrafine materials, the practice of dump and dilute is the last resort.
- Solids, viscosity, and density should all be controlled with the use of the centrifuge and product additions.
- Ensure solids control equipment is functioning properly hourly.
- Any recommendation for screen changes (for size or condition), must be discussed with the Solids Control personnel, CM, and the Fluid Engineer.

### **Potential Problems:**

- High ROPs are common in this interval. Keep an eye on drill solids increasing and be sure to use proper solids control equipment when necessary to maintain low drill solids.
- Make sure properties are maintained and hole cleaning is not an issue. If hole cleaning becomes an issue, adjust properties accordingly.
- Proper drilling practices are also an integral part of hole cleaning. Reciprocating the full

stand prior to connection will aid in hole cleaning and scrape extra filter cake off the well bore.

- Additions of Cantone will inhibit shale issues and produce a quality filter cake.
- Watch for lost circulation risks and plan ahead accordingly.
- Gel strengths, MBTs, and rheology should be maintained for borehole stability.

7 7/8" Production Interval				
MD (ft)	1,000 to 5,200 feet			
Drilling Fluid System	Ca++ - Fresh water base low solids, nondispersed polymer system			
Interval Target Mud Properties				
Mud Weight (ppg)	8.6 to 10.5		Plastic Viscosity (cp)	8 to 18
Funnel Viscosity (s/qt)	40 to 55		Yield Point (lb/100 ft <sup>2</sup> )	11 to 20
pH	8.5 to 9.5		Ca+ (mg/L)	700 to 1,100
API FL (ml/30 min)	< 8		CaCl (mg/L)	<1,200

#### **Safety Recommendations:**

- Caustic Soda will be utilized throughout this section to maintain pH and alkalinities, so ensure all proper PPE is used when handling (face shield, rubber gloves, and apron).
- Wear a respirator while mixing all drilling additives.
- Review MSDS prior to use of unfamiliar materials.

#### **Interval Objective:**

- Drill a 7 7/8" hole from 1,000-5,200 ft (MD) and run 5 1/2" casing.
- The recommended fluid system for the end of the 7 7/8" interval from 1,000-5,200 ft (MD) is Ca++ LSND.

#### **Mud Weight:**

- Mud density in this interval should range from 8.6-10.5 ppg.
- Mud weight should be increased as needed to assist with shale ECD's.
- Use solids control equipment as needed.
- Maintain expected MW or as hole conditions dictate per Drilling Engineer and/or Company Man.
- If higher MW is required and lower solids are required, raise MW with additions of barite.  
See calculation below: Equation: Sacks of Barite (100 lb sacks) = Total Volume x 14.9 x (Final MW (ppg) - Original MW (ppg))/(35 - Final MW (ppg))  
Example: Sacks of Barite (100 lb sacks) = 1000 bbls x 14.9 x (10.0 ppg - 9.0 ppg)/(35 - 10.0 ppg) = 596 sacks

- Take continuous MW readings while mixing barite.

### **System Maintenance:**

- Raise pH (8.5 -9.5) with caustic soda through the Chem barrel.
- Raise the total hardness to **700-1100 mg/l** with additions of Gypsum to control sloughing shales.
- A sudden drop in pH could signal the presence of CO<sub>2</sub> in the formation and immediate action will be required to counteract the CO<sub>2</sub>. If CO<sub>2</sub> is encountered, pH will decrease, the bicarbonate reading on the alkalinity mud test will increase, and viscosity will decrease.
- Add Lime as needed over a circulation and running Caustic through the chemical barrel until pH is back to **8.5-9.5**.
- Maintain FV around **40-55 s/qt**.
- Begin lowering API FL to **<8 ml/30 min** with the addition of FLA.

### **Solids Control:**

- Use the best combination of screens on the shakers, DeSander, DeSilter, and Centrifuge for the system.
- If available, run centrifuge in mechanical stripping mode constantly to maintain solids content at or below **8%**. (Note: Running centrifuge in full mechanical stripping mode will strip HGS from the system - additional barite will be needed after running centrifuge in this manner.) If the centrifuge is ineffective in stripping ultrafine materials, the practice of dump and dilute is the last resort .
- Solids, viscosity, and density should all be controlled with the use of the centrifuge and product additions.
- Ensure solids control equipment is functioning properly hourly.
- Any recommendation for screen changes (for size or condition), must be discussed with the Solids Control personnel, CM, and the Fluid Engineer.

### **Potential Problems:**

- High ROPs are common in this interval. Keep an eye on drill solids increasing and be sure to use proper solids control equipment when necessary to maintain low drill solids.
- Make sure properties are maintained and hole cleaning is not an issue. If hole cleaning becomes an issue, adjust properties accordingly.
- Proper drilling practices are also an integral part of hole cleaning. Reciprocating the full stand prior to connection will aid in hole cleaning and scrape extra filter cake off the well bore.
- Additions of Contone will inhibit shale issues and produce a quality filter cake .
- Watch for lost circulation risks and plan ahead accordingly.

- Gel strengths, MBTs, and rheology should be maintained for borehole stability.

#### **4.5. Electric Logging Program**

The intended electric wireline logging program at total depth (TD) will include:

- High Definition Induction Log
- Compensated Z-Densilog
- Compensated Neutron Log
- Gamma Ray Log
- Caliper Log.

We intend to use Baker Hughes for wireline logging; however this may change subject to availability. Logs will be made available to IDL as required.

### **5. Completion**

Method of completion will be determined subsequent to review of open-hole log data and cased hole cement bond logs (CBL). If the well is to be completed, it will be equipped with a 3,000 psi WP tree with appropriate spools and valving for access to each annular and tubular space. Also, if the well is completed, we anticipate using 2 7/8" API J-55 6.5 lb/ft production tubing. Hydraulic fracturing is not contemplated and the expectation is that these potential reservoirs will respond to conventional completion techniques.

### **6. Abandonment Procedure**

If the well is nonproductive, the well will be plugged with cement in accordance with appropriate State of Idaho regulations as described in IDAPA 20.07.02 section 320 – Well Plugging.

### **7. Reclamation of Drill Site**

Reclamation will be conducted in accordance with IDAPA 20.07.02.325. To achieve those requirements, Trendwell West, Inc. intends to address reclamation through a multistep process which is outlined below. As provided for in IDAPA 20.07.02.325.08, Trendwell West, Inc. will enter into a Surface Use Agreement with the landowner the terms of which will ensure that the site is left in a stable, non-eroding condition as required.

1. Re-establish slope stability, surface stability, and desired topographic diversity.
2. Maintain the integrity of the topsoil and subsoil (where appropriate and not otherwise dictated by the Surface Use Agreement)

3. Prepare site for revegetation upon completion of well activities - plugging/abandonment.
  - a) Redistribute soil materials in a manner similar to the original vertical profile.
  - b) Provide suitable conditions to support the long term establishment and viability of the desired plant community.
  - c) Protect seed and seedling establishment (e.g. erosion control matting, mulching, hydro-seeding, surface roughening, fencing, etc. to be determined based upon site specific conditions
4. Establish a desired self-perpetuating native plant community based upon region specific guidance available from NRCS
  - a) Establish species composition, diversity, structure, and total ground cover appropriate for the desired plant community
  - b) Select genetically appropriate and locally adapted native plant materials based on the site characteristics and setting.
  - c) Select non-native plants only as a short term and non-persistent alternative to native plant materials. Ensure the non-natives are designed to aid in the re-establishment of native plant communities. Revegetate in accordance with best practices described below:
  - d) Plant communities shall be evaluated annually for two years to ensure revegetation success as determined by IDAPA 20.07.02.325



State of Idaho

DEPARTMENT OF WATER RESOURCES

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C.L. "BUTCH" OTTER  
Governor

GARY SPACKMAN  
Director

January 30, 2014

Bobby Johnson, P.G.  
Oil and Gas Program Manager  
Idaho Department of Lands  
300 N. 6th Street, Suite 103  
Boise, ID 83702

RE: Oil Wild Cat well application, Trendwell West, Inc. Smith Well number 1-10

Mr. Johnson,

Thank you for providing Idaho Department of Water Resources an opportunity to review and comment on the application to drill a gas exploration well submitted by Trendwell West, Inc. IDWR staff reviewed the applications and drilling plan for the proposed well and submits the following comments for your consideration.

1. IDAPA 37.03.09.010.66.c.ii states "holes drilled for oil and gas exploration which are subject to the requirements of Section 47-320, Idaho Code" are not considered a well. Therefore the proposed boring is not subject to permitting requirements of IDAPA 37.03.09.
2. IDAPA 37.03.09.045.03 states that excluded borings that are not considered wells still need to comply with the minimum standards for modification, construction, or decommissioning. The proposed boring satisfies the minimum construction standards, however if the boring is not produced for oil or gas, it cannot be used for any other purpose and must also be decommissioned in accordance with IDAPA 037.03.09.025.16.
3. Idaho does not have authority from the Environmental Protection Agency to permit Class II injection wells to inject brines and other fluids associated with oil and gas production wells. The applicant should be made aware of this as it may have implications on their production plans.
4. If groundwater is to be pumped to support the drilling activities the applicant should contact a water right agent at IDWR to discuss obtaining a temporary water right.

Sincerely;

Chad F. Hersley, P.G.  
Technical Hydrogeologist  
Ground Water Protection Section